

Energy

The programs in budget function 270 fund energy research, production, conservation, and regulation. This function includes the Department of Energy's (DOE's) civilian programs, such as energy-related research and development; operation of the Strategic Petroleum Reserve; environmental cleanup of federal sites used for civilian energy research and production; development of a repository for nuclear waste at Yucca Mountain, Nevada; and grants to states for energy conservation measures. The costs of regulating energy production and distribution are also part of this function, but those expenses are offset almost entirely by fees charged to the regulated entities. In addition, function 270 covers federal agencies that generate and sell electricity, such as the Tennessee Valley Authority (TVA, an independent agency) and the four power marketing administrations (PMAs) that are managed by DOE. Loan programs to benefit rural electric and telephone cooperatives, managed by the Rural Utilities Service within the Department of Agriculture, are

also included in this budget function. (DOE's atomic weapons activities are included in budget function 050, national defense.)

The net outlays of function 270 are typically small—and in some years negative—because they include offsetting receipts from the sale of electricity by TVA and the PMAs, fees paid by the nation's nuclear utilities for future storage of nuclear waste, and loan repayments to the Rural Utilities Service. Excluding those receipts, spending for this function will total about \$3.8 billion in 2005, the Congressional Budget Office estimates. That amount, although significantly lower than the levels of discretionary spending in much of the 1990s, is about 25 percent higher than the figure for 2003—largely because of increased funding for energy research, conservation programs, and environmental cleanup expenses for certain DOE facilities.

Federal Spending, Fiscal Years 2000 to 2005 (Billions of dollars)

	2000	2001	2002	2003	2004	Estimate 2005	Average Annual Rate of Growth (Percent)	
							2000-2004	2004-2005
Budget Authority (Discretionary)	2.7	3.2	3.2	3.2	3.6	3.8	7.1	7.3
Outlays								
Discretionary	3.0	2.9	3.0	3.1	3.4	3.8	3.4	13.6
Mandatory	-3.7	-2.9	-2.5	-3.8	-3.6	-3.0	n.a.	n.a.
Total	-0.8	*	0.5	-0.7	-0.2	0.9	n.a.	n.a.

Note: * = between zero and \$50 million; n.a. = not applicable (because some years have negative values).

270-01—Discretionary**Eliminate the Department of Energy's Applied Research for Fossil Fuels**

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Spending							
Budget authority	-428	-554	-565	-576	-586	-2,709	-5,818
Outlays	-128	-316	-470	-530	-568	-2,013	-5,051

The Department of Energy (DOE) receives about \$500 million in appropriations each year to fund research on applied technologies for finding and using petroleum, coal, and natural gas. Those research programs were created at a time when the prices of some fossil fuels were controlled and, as a result, market incentives for technology development were muted. Now that energy markets have been partially deregulated and are operating more freely, the value of federal spending for such research and development efforts is more in question.

This option would eliminate DOE's applied research programs for fossil fuels, saving \$128 million in outlays in 2006 and \$2.0 billion over the next five years.

A rationale for ending those programs is that energy markets give suppliers sufficient incentives to develop better technologies and bring them to market. Private entities are generally more attuned than federal officials are to which new technologies have commercial promise. Federal programs have a long history of funding fossil-fuel technologies that, although interesting technically, have little chance of commercial implementation. A related rationale for eliminating the applied fossil-fuel research programs is that DOE should concentrate on basic energy research—such as developing the basic science for a new energy source—and reduce its involvement in developing applied technology. Arguably, the federal government has a clearer role to play in funding such basic research because the benefits are widespread rather than concentrated in individual companies.

Contrary to those assertions, a panel of the National Academy of Sciences concluded in 2001 that “DOE's RD&D [research, development, and demonstration] programs in fossil energy and energy efficiency have yielded significant benefits (economic, environmental, and national security-related), important technological options

for potential application in a different (but possible) economic, political, and/or environmental setting, and important additions to the stock of engineering and scientific knowledge in a number of fields.” The panel reported that although many of the earliest fossil-fuel programs (which emphasized synthetic fuels and other large-scale demonstrations) had produced below-average returns, projects since 1986 (which were more diverse and less focused on high-risk demonstrations) had yielded higher returns.

Another argument against this option is that DOE's applied research may help curtail the environmental damage resulting from the production and consumption of fossil fuels by supporting research that allows those fuels to be used with less harm to the environment, thus decreasing their cost to society. DOE's research programs may also increase the efficiency of energy use and thereby lessen U.S. dependence on foreign oil. A further argument against eliminating those programs is the role they are playing in the continued development of fuel-cell technology. Fuel cells, which have declined in cost, appear to be just a few years away from displacing more-conventional energy sources in a wide variety of markets, from cell-phone batteries to household electrical use. However, as fuel cells come closer to the market, private firms will have greater incentive to invest in the technology and better market information than DOE does.

In its assessment of federal programs for the President's 2005 budget, the Office of Management and Budget (OMB) concluded that DOE's program to fund research on fuel cells to power the electrical grid has a clear purpose, is free of design flaws, and serves a national need. However, OMB stated that programs in other areas of fossil-fuel research, such as oil and natural gas technologies, duplicate private-sector spending.

270-02—Discretionary

Eliminate the Department of Energy’s Applied Research for Energy Conservation

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Spending							
Budget authority	-485	-617	-629	-641	-653	-3,026	-6,488
Outlays	-243	-478	-603	-633	-645	-2,603	-6,023

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In 2005, the Department of Energy (DOE) received appropriations of \$596 million for programs to develop energy-conserving technologies. Those programs fund research on automobiles that use fuel cells (the FreedomCAR Partnership discussed in option 270-05) and on industrial and residential energy efficiency. (In addition, DOE provides grants to state and local agencies for energy conservation; those grants are discussed in option 270-04.) The involvement of federal agencies in selecting and developing technologies with near-term commercial prospects may be questionable.

This option would eliminate DOE’s applied energy-conservation research programs, saving \$243 million in outlays in 2006 and \$2.6 billion over five years. (Because those programs and the FreedomCAR Partnership overlap, savings from eliminating both would be smaller than the sum of individual savings shown for the two options.)

The major rationale for this option is that the federal government should forgo developing applied energy technology, which benefits specific firms in the short run, and concentrate on basic research in the underlying science, which provides broader, long-term benefits to the energy sector as a whole. Many projects funded through DOE’s applied energy-conservation research are small and discrete enough—and have a sufficiently clear market—to warrant private investment. In such cases, DOE may be crowding out private companies. In other cases, the results of the research and development conducted by those programs may prove too expensive or esoteric for the intended recipients to implement. Moreover, those programs may duplicate support provided by other federal policies. For example, federal law sets minimum energy-efficiency standards for appliances and cars, and the tax code favors investments in conservation technologies.

Addressing those concerns, a 2001 panel of the National Academy of Sciences determined that “DOE’s RD&D [research, development, and demonstration] programs in fossil energy and energy efficiency have yielded significant benefits (economic, environmental, and national security-related), important technological options for potential application in a different (but possible) economic, political, and/or environmental setting, and important additions to the stock of engineering and scientific knowledge in a number of fields.” The panel concluded that the energy-conservation research programs had particularly benefited the construction industry—a widely dispersed industry with no substantial record of technological innovation.

Another argument against eliminating those programs is that federal research and development in the area of energy conservation may help offset failures in energy markets. For example, current energy prices may not reflect the damage to the environment—including the potential for global warming—caused by excessive reliance on fossil fuels. Energy conservation could decrease that damage (and thus the costs to society of producing and using energy) as well as the nation’s dependence on foreign oil.

For the President’s 2005 budget, the Office of Management and Budget assessed some of DOE’s applied energy-conservation research programs and rated them as adequate. The building-technology program was cited as coordinating well with private industry and other parts of the government to ensure that its work focused on technologies not yet ready for commercial exploitation. It was also lauded for providing road maps of technological development for industry. Other programs were similarly cited.

270-03—Discretionary

Eliminate the Department of Energy’s Applied Research for Renewable Energy Sources

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Spending							
Budget authority	-314	-400	-407	-415	-423	-1,959	-4,202
Outlays	-141	-306	-374	-405	-417	-1,644	-3,855

In 2005, the Department of Energy (DOE) received appropriations of \$386 million to fund research and development (R&D) of solar power and other renewable sources of energy. By far the largest efforts funded by those programs involve developing alternative liquid fuels from plant materials (or biomass) and producing electricity from photovoltaic cells. Smaller efforts involve electric-energy storage and wind power.

This option would eliminate federal funding for applied research on renewable energy, saving \$141 million in outlays in 2006 and \$1.6 billion through 2010.

The principal rationale for this option is the belief that the federal government should support basic scientific research, which can benefit the energy sector as a whole over the long term, rather than development of applied energy technology, which will benefit specific firms. Federally sponsored researchers lack the market incentives and information that help researchers in private companies recognize marketable technologies.

Another argument for ending DOE’s renewable-energy R&D programs is that many of the projects they fund are sufficiently small and discrete, and have a clear enough market, to attract private funding. Commercial markets exist for several renewable-energy technologies—most notably, wind power and photovoltaic cells. According to industry estimates, the global market for wind-energy systems has grown rapidly and is now worth several billion dollars. Similarly, the photovoltaic market has been expanding by more than 30 percent per year. In such cases,

the time may have come for an orderly withdrawal of federal support. Given the large U.S. venture-capital market, continued federal funding may be displacing private investment.

A further rationale for eliminating DOE’s applied renewable-energy research is that other government efforts promote the same goals. The federal tax code provides incentives for development of liquid fuels from renewable resources, especially biomass. For example, ethanol fuels receive special treatment under the federal highway tax (see Revenue Option 29). In addition, federal regulations authorized by many different statutes favor alcohol fuels, which now usually mean fuels based on corn.

Several arguments, however, weigh against ending federal funding for renewable-energy research. First, incentives for private research may be insufficient because energy prices fail to incorporate the risks posed by the nation’s dependence on fossil fuels. Second, the United States plays the role of international R&D laboratory for less-developed countries, which often have much higher energy costs. Third, a recent analysis by the National Academy of Sciences showed that many DOE-sponsored renewable-energy programs had met their goals to lower the costs and improve the performance of specific technologies. The fact that those technologies are not in widespread use results not from technical failures, according to the analysis, but from even larger decreases in the cost of conventional energy and, to some extent, from institutional obstacles.

The Office of Management and Budget (OMB) reviewed some of DOE's renewable-energy initiatives as part of its assessment of federal programs for the President's 2005 budget and rated them as moderately effective on the whole. In many instances, OMB said, program offices worked to ensure that the research they sponsored did not

duplicate efforts by the private sector or other government programs. For example, although the geothermal energy program focuses on drilling methods, as does the oil industry, the geothermal environment is different enough (deeper, hotter, and more challenging chemically) to require specialized technologies.

RELATED OPTIONS: 270-01, 270-02, 270-04, 270-05, and Revenue Option 29

270-04—Discretionary

Eliminate the Department of Energy’s State and Community Grants for Energy Conservation

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Spending							
Budget authority	-36	-46	-46	-47	-48	-223	-479
Outlays	-18	-35	-45	-47	-48	-192	-445

The Department of Energy’s (DOE’s) Office of State and Community Programs provides various grants to support energy-conservation efforts at the state and municipal level. Weatherization-assistance grants help low-income households reduce their energy bills by installing weather stripping, storm windows, and insulation. Institutional-conservation grants help lessen the use of energy in educational and health care facilities; they add federal funds to private-sector and local-government spending to encourage local investment in improvements to buildings. The Office of State and Community Programs also supports state and municipal programs that establish energy-efficiency standards for buildings and promote public transportation and carpooling, among other initiatives.

This option would eliminate funding for DOE grant programs that support energy-conservation activities by states and localities. Ending those grant programs would save \$18 million in outlays in 2006 and \$192 million over the next five years.

One rationale for eliminating those energy-conservation grants is that other federal programs (such as the Low Income Home Energy Assistance Program block grants) and laws (such as the Clean Air Act Amendments of 1990) promote similar conservation actions. Moreover, direct federal funding may principally serve to enable state and local governments to replace local funding for energy conservation and redirect their tax revenues to altogether different uses.

Opponents of this option maintain that ending DOE’s grant programs could make it harder for states to continue their energy-conservation efforts. Many states rely heavily on such grants to help low-income households and public institutions. In addition, reductions in energy use because of those programs could help lower emissions of greenhouse gases.

RELATED OPTIONS: 270-01, 270-02, 270-03, 270-05, and 300-14

270-05—Discretionary

Eliminate Funding for the FreedomCAR Partnership

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Spending							
Budget authority	-163	-166	-169	-172	-175	-845	-1,774
Outlays	-81	-140	-167	-170	-173	-731	-1,649

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The FreedomCAR Partnership is a joint federal/private research effort to foster the development of energy-efficient vehicles, mainly by promoting research into fuel-cell technology. (Fuel cells produce electricity by stripping the electrons from hydrogen fuel. They are relatively clean sources of power because when the electrons are recycled back into the remaining fuel mixture and combined with oxygen, the only emissions they produce are air and water vapor.) The FreedomCAR Partnership—which is led by the Department of Energy’s (DOE’s) Office of Energy Efficiency and Renewable Energy—also sponsors research into combustion and emission systems, lightweight materials, electronics, and batteries suitable for use in energy-efficient vehicles. The partnership complements a broader federal effort to develop hydrogen-based sources of energy for automotive and other uses.

This option would eliminate federal funding for the FreedomCAR Partnership, which would reduce discretionary outlays by \$81 million in 2006 and \$731 million over the 2006-2010 period. However, because the FreedomCAR Partnership and DOE’s energy-conservation and renewable-energy programs (discussed in options 270-02 through 270-04) are related, if those programs were eliminated as well, the total savings would be less than the sum of the savings shown for the programs individually.

One argument for ending federal support for the FreedomCAR Partnership is that the program that preceded it—the Partnership for a New Generation of Vehicles—lagged in its efforts to create a production-ready hybrid vehicle (one powered by a combination gas and electric motor). By mid-2004, the primary hybrid vehicles available to U.S. consumers were produced by Honda and Toyota, two foreign automakers. Thus, the efficacy of yet another U.S. research partnership between the public and private sectors in this area may be questionable. Further, U.S. automakers have already begun conducting fuel-cell research, and competitive pressure from their foreign

counterparts may spur those efforts. In 2002, Honda began leasing a fuel-cell-powered vehicle to employees of the city of Los Angeles, and Toyota has made fuel-cell vehicles available to U.S. government test fleets. As a result, sufficient economic incentives to undertake such efforts may already exist in the private sector—in which case, government financial support would simply provide a subsidy without inducing more research.

Another argument for this option is that rather than supporting applied research, the federal government could more effectively increase the efficiency of the nation’s automotive fleet by raising gasoline taxes, imposing user fees on the purchase of low-mileage-per-gallon vehicles, or both. When gasoline prices rose in 2004, demand for hybrid vehicles increased sharply, causing buyers to endure unexpected waiting lists and, in some cases, to pay a markup over list price to purchase those vehicles. Likewise, higher gasoline taxes or user fees would increase the incentives for consumers to buy energy-efficient automobiles. Such policies might also spur more-productive research—because automakers would have a greater incentive not only to conduct research into fuel-cell technology but also to broaden their research efforts to include other potential sources of fuel efficiency, such as more-sophisticated drive trains and transmissions and lightweight but durable chassis and body materials. Indeed, although hydrogen-powered vehicles may emit no pollutants, generating hydrogen fuel using current production technologies imposes a significant environmental burden.

An argument against eliminating the FreedomCAR Partnership is that imperfections in energy markets and environmental considerations make it desirable for the government to promote energy-efficient technologies, because the private sector has less incentive to undertake that research than society has to see it undertaken. Thus, without government sponsorship, the private sector might underfund research in energy efficiency.

270-06—Mandatory

Restructure the Power Marketing Administrations to Charge Higher Rates

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Receipts	0	+220	+220	+220	+220	+880	+1,980

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The three smallest power marketing administrations (PMAs) of the Department of Energy—the Western Area Power Administration, the Southwestern Power Administration, and the Southeastern Power Administration—sell about 1 percent of the nation’s electricity. The PMAs generate electricity mainly from hydropower facilities constructed and operated by the Army Corps of Engineers and the Bureau of Reclamation. Current law requires that the electricity be sold at cost—a pricing structure intended ultimately to reimburse taxpayers for all of the costs of operating those facilities, a share of the costs of construction, and interest on the portion of total costs that has not been repaid. Interest charges are generally below the government’s cost of borrowing. Those lower charges, along with the low cost of generating electricity from hydropower, mean that the PMAs can charge their customers much lower rates than other utilities do. Current law also requires the PMAs to offer their power first to rural electric cooperatives, municipal utilities, and other publicly owned utilities.

This option would require those three PMAs to sell electricity at market rates to any wholesale buyer. The higher rates would provide the federal government with about \$880 million in additional receipts over the 2006-2010 period. (The President’s budget for 2006 indicates that the Administration intends to “propose legislation to very gradually bring PMA electricity rates closer to average market rates throughout the country.”)

Supporters of this change argue that the rationale for continuing to subsidize federal electricity sales is weak, for several reasons. First, they say, such subsidies are not needed to counter the market power of private utilities because those utilities are kept in check by federal and state regulation of the electricity supply, by federal anti-trust laws, and increasingly by competition from independent producers. Second, in many cases, the communities that receive federal power are similar to neighboring communities that do not. Third, federal sales of electricity meet only a small share of the total power needs of households in the regions that the three PMAs serve; thus, raising federal rates would have only a modest impact on those households’ electricity costs. Fourth, the PMAs face the prospect of significant future costs to perform long-deferred maintenance and upgrades—costs that could be budgeted for by increasing power rates now. Finally, selling electricity at below-market rates can encourage inefficient use of energy.

A potential drawback of this option is that changing the pricing structure of those three PMAs could greatly increase electricity rates for the many small and rural communities they serve. Other arguments against this change are that the federal government should continue providing low-cost power to counter the uncompetitive practices of investor-owned utilities and to bolster the economies of certain parts of the country.

RELATED OPTIONS: 270-07, 270-08, 270-09, and Revenue Option 30

RELATED CBO PUBLICATION: *Should the Federal Government Sell Electricity?* November 1997

270-07—Mandatory

Sell the Southeastern Power Administration and Related Power-Generating Assets

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Receipts	0	0	+1,304	-214	-218	+872	-278

The Department of Energy’s Southeastern Power Administration (SEPA) sells electricity from hydropower facilities constructed and operated by the Army Corps of Engineers. SEPA pays private transmission companies to deliver that power to more than 300 wholesale customers, such as rural cooperatives, municipal utilities, and other publicly owned utilities. SEPA charges rates that are designed to recover for taxpayers all of the costs of current operations, some of the costs of construction, and a nominal interest charge on the portion of total costs that has not yet been recovered. On average, SEPA sells power for about 2.2 cents per kilowatt-hour, compared with as much as 5.0 cents per kilowatt-hour for some utilities in its region.

This option would sell the power-generating assets that SEPA uses, such as turbines and generators owned by the Army Corps of Engineers, though not the related dams, reservoirs, or waterfront properties. The sale would also include rights of access to the water flows necessary for power generation, subject to the constraints of competing uses for the water. That sale would net the federal government \$872 billion in added receipts over the 2006-2010 period—\$1.5 billion in proceeds from the sale (based on SEPA’s most recent audited statement of its assets and liabilities) minus about \$640 million in lost electricity revenues over that period. (In addition, the federal government would save about \$45 million a year in discretionary outlays from ending appropriations to SEPA and reducing appropriations to the Corps of Engineers for operations. Those discretionary savings are not included in the table above.)

Supporters of this option argue that selling federal power-generating assets is consistent with the policy goal of making energy markets more efficient. They say that the original reasons for establishing SEPA—marketing low-cost power to promote competition and foster economic development—are no longer compelling because of the small amount of power that SEPA sells and because of competitive and regulatory constraints on commercial power rates. Moreover, selling federal hydropower facilities would not mean transferring all responsibility for managing and protecting water resources to the private sector. The Corps of Engineers could remain directly responsible for managing water flows for all uses, including the upkeep of basic physical structures and surrounding properties. Or, as has happened with other nonfederal dams, the terms of the federal licenses to operate the facilities (issued by the Federal Energy Regulatory Commission) could determine the management of water flows for competing purposes.

An argument against ending federal ownership of SEPA is that nonfederal entities may lack the proper incentives to perform all of SEPA’s functions. Many Corps of Engineers facilities serve multiple purposes, such as managing water resources for navigation, flood control, or recreation as well as for power generation. In addition, selling SEPA could result in higher power rates for its customers. Although electricity sold by SEPA meets only about 1 percent of total power needs in the 11 states in which the agency operates, a few rural communities depend heavily on that electricity.

RELATED OPTIONS: 270-06, 270-08, 270-09, and Revenue Option 30
RELATED CBO PUBLICATION: *Should the Federal Government Sell Electricity?* November 1997

270-08—Mandatory**Sell Most of the Tennessee Valley Authority's Electric Power Assets**

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Receipts	-5	-5	-5	+16,000	-800	+15,185	+11,385

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The Tennessee Valley Authority (TVA) was established in 1933 to control flooding, improve navigation, and develop the hydroelectric resources of the Tennessee River for the benefit of a seven-state region in the southeastern United States. Since then, TVA has developed an extensive network of transmission facilities and nuclear and fossil-fuel-powered generating plants and has become the largest producer of electricity in the nation. Under current law, TVA controls its spending and rate setting, with no regulatory oversight. The agency has ready access to capital because investors assume that its obligations would be paid off by the government in the event of default, even though current law states that TVA's debt is not backed by the government. The only limit on the agency's liabilities—a statutory cap of \$30 billion on its bonds—has less meaning now than in the past because TVA has been able to raise capital using various third-party financing arrangements, which both circumvent that cap and enable TVA to take advantage of certain tax benefits.

This option would return TVA to its original, more limited function of managing the region's hydropower resources. Other TVA power assets for which a commercial market exists—such as the agency's fossil-fuel and nuclear power plants and its transmission lines—would be sold. If, as is likely, proceeds were less than the amount of TVA's outstanding debt, taxpayers would probably have to bear some of the cost of servicing that debt (whatever was not defrayed using future receipts from hydropower activities).

This option assumes that the sale of TVA's generation and transmission assets would be completed by the end of 2009 and would raise about \$16 billion. That estimate is based on recent market transactions for electricity-

generating facilities, but proceeds could be higher or lower. The \$16 billion estimated market value of TVA's assets is less than the agency's outstanding financial obligations—which have risen to about \$26 billion—in part because TVA invested some \$6 billion in nuclear power plants that were never completed and also experienced significant cost overruns in the construction of other nuclear plants. Thus, some portion of TVA's debt would probably be retained by the government.

One rationale for this option is that electricity generation and transmission are fundamentally private-sector activities. In addition, this option would reduce the scope—and hence the risk to taxpayers—of future investments by TVA. Selling the agency's commercial power assets would also eliminate the implicit subsidy that TVA receives because its status as a federal agency earns it high bond ratings. Finally, private-sector operation of TVA's electric power assets in a competitive environment could result in some increased efficiencies relative to those under federal operation.

An argument against selling most of TVA is that the agency has played, and should continue to play, a central role in the economic development of its seven-state region. The net benefit to taxpayers from the sale is uncertain because it would depend on the price actually paid for facilities, on the costs that TVA would otherwise incur if it continued to invest in power and transmission facilities, and on trends in electricity prices and markets. In addition, TVA's ratepayers could face higher electricity prices in the absence of federal subsidies.

As an alternative to privatization, the government could add a surcharge to TVA's transmission rates (see option 270-09).

RELATED OPTIONS: 270-06, 270-07, 270-09, and Revenue Option 30

RELATED CBO PUBLICATION: *Should the Federal Government Sell Electricity?* November 1997

270-09—Mandatory

Require the Tennessee Valley Authority to Impose a Transmission Surcharge on Future Electricity Sales

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Receipts	0	+275	+275	+275	+275	+1,100	+2,475

The Tennessee Valley Authority (TVA) is the biggest producer of electricity in the United States and the sole supplier to retail utilities, large industrial customers, and federal agencies in much of the Southeast. TVA is supposed to set electricity rates on the basis of its costs so that, over time, its receipts from selling power will be sufficient to pay for routine operations, depreciation of productive assets, and certain other activities. However, current rates are not high enough to pay off the \$4.1 billion that the agency has invested in nuclear power plants that have never been completed.

TVA may have difficulty raising funds to recover the costs of those investments, for a number of reasons. First, it expects to compete with other utilities in the future and believes that charging higher rates would cause it to lose customers to those competitors, possibly resulting in lower revenues overall. Second, TVA has made commitments to its customers that it says effectively preclude it from raising rates before 2007. Third, TVA has additional liabilities to cover that were financed through leasebacks and other nontraditional means. Those arrangements have raised concerns about circumventing the \$30 billion statutory limit on the agency’s debt.

This option would require TVA to impose a surcharge on electricity transported over its transmission lines, regardless of the source of the power. The surcharge would be set so as to recoup \$2.5 billion of TVA’s \$4.1 billion investment in uneconomic nuclear power assets over 10 years. (The rest of that investment would be recouped from existing TVA rates.) The higher surcharge would increase federal receipts by \$1.1 billion over the next five

years. This option would also redefine TVA’s debt limit to include related liabilities arising from long-term contracts and would gradually scale back that limit to \$20 billion (\$6 billion less than the current level of outstanding financial obligations) to ensure that revenues collected from the surcharge went toward lowering the agency’s debt burden.

If TVA fails to recoup the costs of its investments through increased rates, the burden may fall on taxpayers nationwide. Imposing a surcharge on transmission services would mean that customers in TVA’s traditional service area would pay for the agency’s uneconomic investments (even if they switched electricity suppliers), thus lessening the possibility that taxpayers at large would be saddled with those costs. Moreover, such a surcharge would probably not cause TVA to lose customers because it would apply to all sales of electricity in the area. Many states have authorized similar tariff surcharges to help local utilities recover the costs of investments that proved to be uneconomic when competition was introduced in the wholesale electricity market.

An argument against a transmission surcharge is that if it resulted in raising the rates charged by all electricity suppliers, the Southeast region could be adversely affected. In addition, requiring a transmission surcharge could constrain TVA’s ability to formulate plans for paying off its uneconomic investments. For example, some people could argue that the most efficient solution would be for TVA to write off part of the \$4.1 billion investment in unproductive nuclear assets at taxpayers’ expense.

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RELATED OPTIONS: 270-06, 270-07, 270-08, and Revenue Option 30
RELATED CBO PUBLICATIONS: *Electric Utilities: Deregulation and Stranded Costs*, October 1998; and *Should the Federal Government Sell Electricity?* November 1997

270-10—Discretionary**Eliminate the Department of Energy's Clean-Coal Technology Programs**

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Spending							
Budget authority	-50	-51	-52	-53	-54	-259	-543
Outlays	-2	-8	-15	-28	-48	-101	-373

The Department of Energy (DOE) funds investment in new technologies that are designed to increase efficiency and reduce emissions at coal-fired electricity-generating plants. Such funding was originally provided through DOE's Clean Coal Technology Program, which was created in 1984 as part of a U.S.-Canadian agreement to help curb acid rain. Currently, two DOE programs provide funding for industry projects intended to demonstrate the commercial feasibility of advanced clean-coal technologies. One program is the Clean Coal Power Initiative (CCPI), a cost-sharing partnership in which the government pays up to 50 percent of each project's cost. The other is the Power Plant Improvement Initiative (PPII), a program that calls for government support to be paid back from future project earnings. To date, funds have been obligated for four projects in the first round of the CCPI selection process. Additional projects that could be funded under the CCPI and PPII are in various stages of negotiation.

This option would end new appropriations for the Clean Coal Power Initiative and the Power Plant Improvement Initiative, saving \$101 million in outlays over the next five years. That change would not affect the \$545 million that has already been appropriated, though not fully obligated, for other new projects.

Supporters of ending further federal funding for coal-technology demonstration projects point out that DOE had trouble finding demonstration projects that merited support even under the original Clean Coal Technology Program. Moreover, they say, the projects funded at that time have yielded almost no payoffs in terms of new technologies for the government or industry: some projects were not completed, and others demonstrated technologies that were not adopted elsewhere. According to those

supporters, the few projects that were successful would probably have been completed without federal aid.

Advocates for curtailing the CCPI and PPII also argue that federal support for clean-coal technologies may be redundant because the private sector already has an incentive to invest in cost-effective technologies that enable coal users to meet existing environmental standards. In addition, many states with significant coal production have their own programs to promote clean-coal use. Also, where federal support is not redundant, they argue, it is likely to be of limited value—for example, because new power-generating technologies and structural changes in electricity markets favor investment in natural-gas-fired plants over coal-fired plants.

Opponents of eliminating support for clean-coal demonstration projects argue that the CCPI and PPII hasten the adoption of new technologies even if those technologies would have been developed anyway. With prices of other fossil fuels high relative to the price of coal, existing coal-burning facilities are likely to be used more intensively. Thus, the benefits from investing in clean-coal technologies sooner rather than later may be all the greater. Opponents of ending the two programs also note that their projects support multiple environmental and economic policy goals, including some not fully addressed by other federal programs—such as reducing emissions of greenhouse gases, supporting employment in regions that produce high-sulfur coal, and encouraging the export of clean-coal technologies to other countries. The Bush Administration supports the programs as furthering the goals of the President's National Energy Policy and several of the President's environmental initiatives, including Clear Skies, Global Climate Change, and Sequestration and Hydrogen Research (also known as FutureGen).

270-11—Mandatory

Index the Fee for the Nuclear Waste Fund to Inflation

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Receipts	+28	+58	+87	+114	+141	+428	+1,527

The Nuclear Waste Policy Act of 1982 authorized the Department of Energy (DOE) to build a long-term storage facility for high-level radioactive waste generated by civilian nuclear power plants and defense activities. Disposing of that waste (mainly spent uranium) safely requires isolating it for perpetuity at secure sites, far from population centers and commercially valuable property. In 1987, the Congress directed DOE to concentrate on the Yucca Mountain region of Nevada as the site for the waste disposal facility. About 90 percent of the waste to be stored there is expected to come from civilian nuclear power plants. To fund the disposal of their radioactive waste, those plants are required to pay a fee of 0.1 cent per kilowatt-hour of electricity they generate. Receipts from the fee are allocated to the federal Nuclear Waste Fund. At the end of fiscal year 2004, that fund held about \$16.3 billion; another \$6 billion had already been spent on site preparations and design.

This option would index the Nuclear Waste Fund fee to increase with inflation each year rather than remain fixed. That change would boost federal revenues by \$28 million in 2006 and \$428 million over the 2006-2010 period.

Storage at Yucca Mountain was originally set to begin in 1998, but DOE does not plan to start accepting radioactive waste before 2010. Final construction of the site awaits the establishment of safety standards by the Environmental Protection Agency and licensing by the Nuclear Regulatory Commission. With such delays, the nominal costs of construction and annual operations are increasing. Currently, the site is expected to cost a total of more than \$57 billion (in 2000 dollars)—nearly double the original estimate.

Proponents of this option note that the Nuclear Waste Fund fee has not changed since 1983 even though estimates of the cost of the storage project have continued to rise. In addition, the national threat of terrorism has in-

creased the importance of the project—and the value of expediting its completion, which would require additional funding. Terrorist groups have shown an interest in attacking nuclear power plants, and such attacks could involve setting fire to the spent uranium that is stored at the plants (generally not in secure facilities). Moreover, as currently designed, the Yucca Mountain facility would only be large enough to store the amount of spent material that civilian nuclear power plants are now holding—about 38 million tons. By 2010, the industry will have accumulated enough additional waste to require another storage area. Thus, continuing collections will be needed for a second, probably more expensive, facility.

An argument against this option is that electricity producers should not pay higher fees because the delays and other increased costs have resulted from poor government management of the project. Some opponents go further and say that waste producers should not have to continue paying anything, now that large uncertainties exist about whether the Yucca Mountain facility will ever be built. The project faces technical challenges involving the design of the storage casks and the geological integrity of the selected site (specifically, how impervious the caverns at Yucca Mountain would be to water seepage or earthquakes). The project is also facing opposition about the location of the storage facility: the site has become less remote since 1982 because of the rapid growth of nearby Las Vegas. Opponents also argue that storing spent nuclear material in many places around the United States may be safer than moving massive amounts of such material across the country to Yucca Mountain through densely populated areas and on critical bridges and tunnels. In their view, spending a smaller amount to improve the security of storage at power plants (using the amounts already collected for the Nuclear Waste Fund) would be more cost-effective than proceeding with the current plan.

270-12—Mandatory

Reduce the Size of the Strategic Petroleum Reserve

(Millions of dollars)	2006	2007	2008	2009	2010	Total	
						2006-2010	2006-2015
Change in Receipts	+525	+499	+484	+472	+476	+2,457	+2,457

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The Strategic Petroleum Reserve (SPR)—a stock of government-owned crude oil stored at four underground sites along the Gulf of Mexico—is intended to help safeguard the United States against the threat of a severe disruption in oil supplies. The reserve currently holds about 675 million barrels of oil and is more than 90 percent full. The Department of Energy (DOE) can draw oil from the SPR at a maximum sustained rate of over 4 million barrels per day—or 25 percent of the oil processed by the nation’s refineries—for about 90 days (after that, the maximum draw rate declines). Over the history of the SPR, the government’s net investment has totaled about \$18 billion for oil and about \$4 billion for storage and transportation facilities. At a price of \$40 per barrel (the average cost of imported oil at the end of 2004), the oil in the SPR would be worth more than \$27 billion.

This option would require DOE to reduce the size and excess capacity of the SPR by closing the smallest storage site, Bayou Choctaw in Louisiana, and selling its 71 million barrels of oil. If the sale took place over five years to minimize the impact on world oil prices, the federal government would gain receipts of about \$525 million in 2006 and \$2.5 billion through 2010. (After that, once the Bayou Choctaw site was decommissioned, appropriations for operating the SPR could be reduced. Those discretionary savings are not included in the table above.)

Since the SPR was established in 1975, DOE has released oil from it in emergency circumstances on five occasions: more than 17 million barrels during the 1991 Gulf War to prop up the U.S. supply of oil, 1 million barrels in 2000 to aid Louisiana refineries after a dry-dock accident, nearly 3 million barrels later in 2000 to help establish a heating-oil reserve for the Northeast in anticipation of a frigid winter, 295,000 barrels in 2002 to help pipeline operators respond to a hurricane, and 5.4 million barrels after hurricanes in 2004. In addition, in 1996 and 1997, the Congress directed DOE to sell oil from the reserve to offset spending on the SPR and other programs.

Although DOE has not received new appropriations for oil purchases, it is continuing to add to the SPR in several ways. Royalties that private companies owe to the federal government for oil production on federal lands are being taken in kind, rather than in cash, and diverted to the reserve. (Almost 110 million barrels are expected to be diverted before that program’s scheduled end.) DOE has also entered into exchange agreements whereby oil companies that borrow government oil or use SPR facilities repay the government with oil. This option does not include any budgetary savings from avoiding government losses in those exchange programs.

Several arguments for reducing the SPR spring from changes in the reserve’s benefits and costs since 1975. Structural shifts in energy markets and the U.S. economy at large have lowered the potential costs of a disruption in oil supplies and consequently the potential benefits from releasing oil in a crisis. In particular, the increasing diversity of world oil supplies and the growing integration of the economies of oil-producing and oil-consuming nations have lessened the risk of a sustained, widespread disruption. In addition, costs to maintain the SPR are rising because many of the reserve’s facilities are aging and have required unanticipated spending for repairs. Moreover, there is doubt about the government’s ability to smooth oil prices through SPR purchases and releases. DOE’s experience with selling oil during the Gulf War and more recently indicates that the process of deciding to release oil and setting its price can add to market uncertainty.

An argument against lowering the current level of SPR reserves is that oil supplies from the Persian Gulf and other regions continue to be unstable. U.S. reliance on imported crude oil—particularly from the Middle East—is predicted to keep growing, so the benefits from programs such as the SPR that are intended to guard against supply disruptions may be growing as well. In addition, an assessment of federal programs by the Office of Management and Budget for the President’s 2005 budget rated the overall SPR program as effective.